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“Filling gaps and removing traps
for sustainable resource management”

Forest Restoration Options on Degraded Hill Sites in the Pomacochas Basin (Amazonas, Northern Peru)

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Abstract

Although most of the northern Peruvian Andes are still dominated by diverse cloud and montane forests, agricultural patches and degraded forests are increasingly expanding, while natural habitats are suffering from insidious fragmentation. Subsequent soil degradation often leads to field abandonment, overused forests, or degraded pastures. However, ecological knowledge on the forest restoration potential, for instance on the dependencies of vegetation cover, soil conditions, exposition, and altitude, is scarce. Therefore, soil and vegetation patterns along nine transects within the upper Pomacochas Basin were investigated. Anthropogenic successional and disturbance grades, geological substrate, and altitude have the most important ecological impacts on vegetation and tree species composition (n=24 sites). Species respond to sandstone versus calcareous substrates, but also to depths of organic soil layers, and light conditions. The absence of organic layers under pastures contrasted with the accumulation of thick organic layers under forest cover. Vegetation composition at succession sites revealed certain starting points for restoration, like a herbal stage, bush stage, or secondary forest that will determine the length of regeneration paths. Pre-forest patches of *Alchornea* sp. and *Parathesis* sp. may act as habitat stepping stones for expeditiously restoring biocorridors of wildlife. Ecologically adapted reforestation, especially on less productive hill sides, can help to connect forests patches, including living fences as biocorridors. If well planned and managed, restoration measures may rebuild and maintain such unfragmented forests which would be of great benefit for the genetic interchange of forest plant and animal species like the flagship mammal species *Aotus miconax*, *Oreonax flavicauda*, *Tremarctos ornatus*, and *Puma concolour*, or for bird species like *Loddigesia mirabilis*, *Xenoglaux loweryi*, and *Rupicola peruviana*. As the Pomacochas Basin is an important biodiversity hub in northern Peru, these afforested forest patches can help to secure the natural heritage. Thus, our findings can contribute to sustainable land use and conservation of a fragile ecoregion. The chances for strong implementation of nature conservation objectives and sustainability goals should be taken now,

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as the local population is interested in sustainable land use forms such as soft eco-tourism and agroforestry, while asking science for advice for an ecological sound development of the region.

Keywords: Andes, biocorridors, cloud forests, ecological sustainability, nature conservation, restoration, soils, trees