

*Conservation planning for people and nature in a Chilean biodiversity hotspot*

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The central zone of Chile is considered to be a global biodiversity hotspot and among the most threatened bioregions in the world. The national protected area system in this region does not adequately protect biological diversity, nor does it provide equitable social access to people. Taking social access into account in reserve design could increase the success of protected areas as a conservation tool by bringing people closer to nature.

In this study we explore scenarios to expand the protected area system in the region towards sectors rich in biodiversity to improve conservation while simultaneously reducing the current inequities in social access to protected areas. We applied a free and open spatial planning software (<https://marxansolutions.org/>) that assists in designing new nature reserves or expanding existing ones to most effectively protect biodiversity given limited resources. This approach was applied to expand the protected area system and identify areas that efficiently meet targets for biodiversity while improving social access at minimal cost. Three scenarios were tested: minimise land cost scenario which prioritize the selection of less expensive sites, the maximum penalty for social access favouring the selection of areas that currently have low social access and the combined land cost and social access scenario that seeks to reduce land cost and improve social accessibility at the same time.

The results show that it is possible to improve social accessibility and biodiversity at a lower cost. Our results showed that the most efficient scenario is the one that jointly considers land cost and social access, which showed that the protected area network could be slightly expanded (3% of the area) to greatly improve biodiversity (by 86%) at a minimal land cost. This would also increase the social accessibility to protected areas (by 18%).

Recent legal recognition of private land conservation in Chile could help cover the costs of conservation through novel public-private partnerships.

Plain language summary from article: Martínez Harms MJ, Wilson KA, Costa MDP, et al. Conservation planning for people and nature in a Chilean biodiversity hotspot. *People Nat.* 2021;00:1–14.

<https://doi.org/10.1002/pan3.10200>