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Riesgo de la comunidad de aves de páramo a la instalación de
parques eólicos

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MAGISTER EN RECURSOS NATURALES RENOVABLES
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DEDICATORIA

A las aves de los páramos del Ecuador

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Resumen

La energía eólica es una de las mejores alternativas para disminuir la dependencia energética de combustibles fósiles, pero puede generar conflictos con la conservación de las aves. Evaluamos la vulnerabilidad de las comunidades de aves de páramo de Ecuador frente al desarrollo de la energía eólica, combinando el riesgo de colisión con turbinas y la sensibilidad de las especies. Para 136 especies de páramo usamos mapas de distribución y su vulnerabilidad a granjas eólicas, lo que permitió describir patrones espaciales y zonas con alta probabilidad de conflicto entre aves y proyectos eólicos. Los resultados muestran un mosaico heterogéneo de vulnerabilidad, con páramos del norte que concentran ensamblajes más sensibles y áreas extensas donde coinciden alta vulnerabilidad y alto potencial eólico, mientras que muchos páramos del sur presentan valores más bajos y mayores extensiones con bajo conflicto potencial. Esta gradiente norte sur de vulnerabilidad resalta la importancia de considerar la variación regional en la planificación de la energía eólica en paisajes de páramo. En conjunto, este marco proporciona una herramienta práctica para orientar la ubicación de proyectos, priorizar medidas de mitigación y apoyar una gestión más compatible con la biodiversidad de páramo.

Palabras clave: energía eólica, páramo, aves, vulnerabilidad, planificación espacial.

Abstract

Wind energy is one of the best alternatives to reduce dependence on fossil fuels, but it can create conflicts with bird. We evaluated the vulnerability of páramo bird communities in Ecuador to wind energy development by combining collision risk with turbines and species sensitivity. For 136 páramo species we used distribution maps and their vulnerability to wind farms, which allowed us to describe spatial patterns and areas with a high probability of conflict between birds and wind projects. Our results reveal a heterogeneous mosaic of vulnerability, with northern páramos holding more sensitive assemblages and extensive areas where high vulnerability and high wind potential coincide, whereas many southern páramos show lower values and larger areas with low conflict potential. This north–south gradient in vulnerability highlights the importance of considering regional variation in wind energy planning in páramo landscapes. Taken together, this framework provides a practical tool to guide project siting, prioritize mitigation measures, and support management that is more compatible with páramo biodiversity.

Keywords: wind energy, páramo, birds, vulnerability, spatial planning.