When Nature Collides: How Natural Disasters Threaten the World's Primates—and What We Can Do About It

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"There must be a plan of action because delaying will be dangerous. Kingfisher is unsure if he is too worried, but every time he counts the fish in the pond, the number of fish seems to decrease. The hot and stressful weather also makes his feathers molt and grow slower. The situation seems life-threatening!"

In "GHG Emissions"; Wild Wise Weird [1]

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As climate change intensifies the frequency and severity of natural disasters, primate species many already teetering on the edge of extinction—are increasingly exposed to sudden environmental shocks. Despite this growing threat, current protected area (PA) designs largely overlook natural disasters as a factor in biodiversity loss. Addressing this critical gap, a recent study by Yang et al. [2] introduces an innovative approach by integrating disaster risk into global conservation strategies for primates.

The researchers developed a Disaster Risk Index (DRI) to evaluate the impact of five major natural disasters—landslides, floods, droughts, wildfires, and cyclones—on 518 primate species worldwide. Landslides emerged as the most severe hazard, affecting 99.6% of species and posing heightened danger to 73% of those already threatened. This is primarily due to their restricted and fragmented habitats in mountainous regions, which are increasingly vulnerable as climate change drives species toward higher elevations.

By overlaying disaster exposure with primate biodiversity data, the study identified zones of both high disaster risk and high conservation need (HDR-HCN areas). Alarmingly, only 30% of these critical regions are currently protected, even though full coverage of HDR-HCN areas into protected areas could help 57 primate species and 67% of all primates meet their conservation targets. An additional layer of analysis revealed that around 50% of HDR-HCN areas are also highly climate-sensitive (HDR-HCN-CS areas), where projected temperature increases exceed 1.5 °C, further compounding ecological vulnerability.

The western Amazon basin stands out as a top priority for the expansion of protected areas, owing to its extensive coverage of 78% of HDR-HCN-CS habitat and relatively low human population density [3,4]. These conditions make it especially suitable for the establishment of large, integrated conservation areas. Conversely, densely populated regions such as Borneo and West Africa present more complex challenges and require adaptive, community-based conservation approaches. These may include area-based conservation measures managed by local or Indigenous communities, sustainable resource use practices, and incentive-driven conservation schemes.

This study highlights a profound interconnection between ecological preservation and human resilience: the very landscapes critical for primate survival are also those most susceptible to the growing threats of natural disasters and climate change. Designing protected areas that incorporate disaster risk not only safeguards primate biodiversity—including some of our closest evolutionary relatives—but also enhances the ecological security of human communities. Ultimately, the findings call for a transformative shift in conservation planning—one that places disaster resilience at the heart of strategies to protect both nature and people.

References

[1] Vuong QH. (2024). Wild Wise Weird. https://www.amazon.com/dp/B0BG2NNHY6/

[2] Yang L, et al. (2025). Integrating natural disasters into protected area designing for global primate conservation under climate change. *Geography and Sustainability*, 6(3), 100242. https://doi.org/10.1016/j.geosus.2024.09.006

[3] Joppa LN, Pfaff A. (2009). High and far: biases in the location of protected areas. *PLoS One*, 4(12), e8273. <u>https://doi.org/10.1371/journal.pone.0008273</u>

[4] Mu HW, et al. (2022). A global record of annual terrestrial Human Footprint dataset from 2000 to 2018. *Scientific Data*, 9, 176. <u>https://www.nature.com/articles/s41597-022-01284-8</u>

[5] Nguyen MH. (2024). How can satirical fables offer us a vision for sustainability? *Visions for Sustainability*. <u>https://ojs.unito.it/index.php/visions/article/view/11267</u>