

New biodiversity map of the Andes shows species in dire need of protection

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The Andes-Amazon basin of Peru and Bolivia is one of the most biologically rich and rapidly changing areas of the world. A new study published in BioMed Central's open access journal *BMC Ecology* has used information collected over the last 100 years by explorers and from satellite images which reveals detailed patterns of species and ecosystems that occur only in this region. Worryingly, the study also finds that many of these unique species and ecosystems are lacking vital national level protection.

Endemic species are restricted to a specific area and occur nowhere else. These species are especially vulnerable to climate and environmental changes because they require unique climates and [soil conditions](#). This makes them an ideal indicator for measuring biodiversity.

A multinational team from the United States, Bolivia, Peru, and other countries mapped a wide range of [ecosystems](#) in Bolivia and Peru, from the wetlands of Beni [savanna](#) and the Iquitos várzea, to the bone dry xeric habitats of inter-Andean valleys, and the cool and humid montane forests along much of the eastern Andean slope. Over 7000 individual records of endemic species locations for 115 birds, 55 mammals, 177 amphibians and 435 plants were combined with climate data (WorldClim), topography (NASA's SRTM), and vegetation (NASA's MODIS satellite sensor), resulting in species distribution maps, accurate to 1km.

Analysis of the maps showed that the highest concentration of endemic

birds and mammals was along a narrow band of the Andes mountains, between 2500 and 3000m above sea level. Endemic amphibian species peaked at 1000 to 1500m and were especially concentrated in southern Peru and northern Bolivia. One of the areas that had the highest levels of 'irreplaceability' and highest number of species for birds and mammals, is an unprotected region surrounding the small World Heritage Site of Macchu Pichu (Cordillera de Vilcabamba, Peru).

Disturbingly, the authors found that a total of 226 endemic species have no national protection and about half of the ecological systems have 10% or less of their range protected. Additionally only 20% of the areas with high numbers of endemic species and 20% of the irreplaceable areas are currently protected.

Dr Jennifer Swenson, from Duke University, who led the research said, "Biodiversity in the Andes is under threat from oil and gold mining, infrastructure projects, illegal crops, and many other activities. There is already evidence of species migrating upslope to keep up with climate change in this region. Conservation across the [Andes](#) needs urgent revising and we hope that our data will help protect this incredibly unique region."

Provided by BioMed Central

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