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Conserving ungulate migration in a changing world: how empirical mapping can guide landscape connectivity and policy

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Every year, migrating ungulates perform some of nature's most spectacular movements as they travel to and from their seasonal ranges. These migrations support more abundant populations, enhance the biodiversity of ecosystems, and provide food for predators and people. However, in the face of rapid development and habitat fragmentation, large land mammal migrations are increasingly threatened, with migrations often truncated before we have adequate maps to understand their movements. The Global Initiative on Ungulate Migration in 2024 launched the *Atlas of Ungulate Migration*, an online repository for migration maps and the best available science on migratory populations around the world. This digital archive represents the collaborative efforts of over 80 researchers, wildlife managers, and cartographers, who have partnered to make migration maps publicly available to conservation planners, development banks, and policymakers. In mapping the initial 30+ migrations in the Atlas, we have identified challenges and opportunities in moving from science to effective conservation policy, and in using empirically driven maps to inform landscape connectivity projects. Actions that conserve mapped ungulate migrations are tangible steps that can help realize broader global conservation policies and terrestrial connectivity objectives, such as Targets 1–4 of the KMGBF's global targets for 2030. Additionally, in mapping the first 22 migrations, we have found that on average, 57% of the corridors (n=22) fall outside of protected areas, representing a significant opportunity to increase conservation measures around this endangered phenomenon. Building an international community of practice also makes possible the first Global Assessment of Ungulate Migrations, which draws on expert opinion to identify unmapped or understudied migratory populations, identify specific threats and conservation opportunities facing migrations across the world, and develop a criteria to rank the most threatened migrations across regions. This assessment will also focus on areas defined as "global migration hotspots" through a novel analysis of IUCN species range data, identifying areas of high conservation value and connectivity needs as well as areas where there are significant knowledge gaps in the conservation and scientific communities' understanding of migratory populations.