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Original Article

Identifying Potential Conservation Corridors Along the Mongolia-Russia Border Using Resource Selection Functions: A Case Study on Argali Sheep

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Abstract

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The disruption of animal movements is known to affect wildlife populations, particularly large bodied, free-ranging mammals that require large geographic ranges to survive. Corridors commonly connect fragmented wildlife populations and their habitats, yet identifying corridors rarely uses data on habitat selection and movements of target species. New technologies and analytical tools make it possible to better integrate landscape patterns with spatial behavioral data. We show how resource selection functions can describe habitat suitability using continuous and multivariate metrics to determine potential wildlife movement corridors. During 2005–2010, we studied movements of argali sheep (*Ovis ammon*) near the Mongolia-Russia border using radio-telemetry and modeled their spatial distribution in relation to landscape features to create a spatially explicit habitat suitability surface to identify potential transboundary conservation corridors. Argali sheep habitat selection in western Mongolia positively correlated with elevation, ruggedness index, and distance to border. In other words, argali were tended use areas with higher elevation, rugged topography, and distances farther from the international border. We suggest that these spatial modeling approaches offer ways to design and identify wildlife corridors more objectively and holistically, and can be applied to many other target species.

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Introduction

Anthropogenic barriers in a landscape can seriously disrupt ungulate migrations (Bolger *et al.,* 2008), and the impacts of such barriers on free-ranging wild ungulate populations is increasingly well documented (Berger, 2004; Ito et *al*., 2008; Harris *et al.,* 2009). Human generated barriers such as fences, pipelines, and other linear structures influence habitat selection of large ungulates as they prevent access to large tracts of continuous habitat (Bolger *et al.,* 2008). Fragmentation of habitat into small patches decreases carrying capacity by preventing temporary escape from