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# LINKING HABITAT SELECTION AND PREDATION RISK TO SPATIAL VARIATION IN FITNESS FOR WOODLAND CARIBOU

Nicholas J. DeCesare\*, Montana Fish, Wildlife and Parks, Missoula, Montana 59804

Mark Hebblewhite, Wildlife Biology Program, University of Montana, Missoula, Montana 59812

Mark Bradley, Parks Canada, Jasper National Park, Jasper, Alberta T0E 1E0 Canada

Dave Hervieux, Sustainable Resource Development, Government of Alberta, Grande Prairie, Alberta T8V 6J4 Canada

Marco Musiani, Faculty of Environmental Design, University of Calgary, Calgary, Alberta T2N 1N4 Canada

A central assumption underlying niche theory and the study of habitat selection is that selected habitats confer enhanced fitness. Here, we separately measured spatial patterns of both resource selection and predation risk and tested their relationships with a key demographic fitness trait, adult female survival, for a threatened ungulate, woodland caribou (*Rangifer tarandus caribou*). We used Cox-proportional hazards spatial survival modeling to assess support for various selection- and risk-based estimates of habitat quality using previously developed caribou resource selection functions and wolf predation risk models. Indeed we found positive relationships between the predicted values of a scale-integrated resource selection function and survival, yet subsequently incorporating predation risk greatly improved models further. Predation risk was an additive source of hazard beyond that detected through selection alone, and selection thus shown to be non-ideal. Furthermore, by combining spatially-explicit adult female survival predictions with herd-specific estimates of recruitment in matrix population models, we demographically estimated a fitness landscape for this threatened species.