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Edge effects on forest caribou movements: a mechanistic model approach

I will present a recent mechanistic model of forest caribou movement in the situation where a road or clear cut perturbs the home range of the animal. Caribou movements are described using a probabilistic approach and an advection-diffusion equation is obtained as a limiting case. The parameters of the model are estimated using field data and simulations are performed using a finite element method with the Steamlined-Upwind Petrov-Galerkin formulation. The main result predicts a steady-state distribution of caribou with a peak in density at 4.6 km from the nearest road or clear cut. This prediction is verified using an independent data set. Collaborators: D. Fortin, A. Fortin, N. Courbin, C. Tye-Gingras (U.Laval), P. Moorcroft (Harvard), R. Courtois et C. Dussault (Ressources naturelles et faune, Québec).