



Maud Menten Institute / Mathematical and Statistical Biology Seminar

Monday, November 18, 2024
12 pm PST (in person)
David Strong Building (DSB) C-130
Join Zoom Meeting
<https://uvic.zoom.us/j/89270000801>
Meeting ID: 892 7000 0801

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One equation helps solve three paradoxes in the spatial ecology of predators and prey

In this talk I will introduce three paradoxes in the spatial ecology of predators and prey (1) Buffer Zone Paradox: Why do wolves maintain stable buffer zones for prey, even though they may be only saving prey for the neighboring packs? (2) Road Use Paradox: Why are wolves attracted to roads and related linear features, even though that can mean higher chances of dying? (3) Path Less Travelled Paradox: Why do wolves preferentially travel to places they haven't been recently, even if it means fewer prey? To help solve these paradoxes, I will start with the Fokker-Planck equation, which describes the probability density function for an individual undergoing a random walk. I will then employ a mixture of mathematical approaches including nonlinear advection-diffusion, differential games, first passage time theory and stochastic processes. All of the resulting models will be fit to data before drawing scientific conclusions.

