Carnivore Territoriality: Simulating Economic Selection of Territories (Poster)

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We are developing theoretical models of territorial behavior of carnivores. This work will be useful for predicting the abundance of wolf (*Canis lupus*) territories in Montana and Idaho. Coupled with a patch occupancy model, it will provide more accurate estimates of abundance of wolves in each state. Ultimately, our work will also provide a better understanding of territorial behavior of a large carnivore. We are simulating the territory selection process for carnivores choosing patches on a landscape based on benefits of prey, where prey distribution ranges from overdispersed to highly clumped. Simulated carnivores will also consider hypothesized costs of patch ownership, including travel, competition, and mortality risk. In each simulation, carnivores will acquire patches for a territory as economically as possible based on these benefits and costs. Simulating various combinations of these hypothesized benefits and costs of patch ownership will provide predictions of territorial behavior. We can then compare these predictions to the territories of real wolves to determine which model is most predictive of actual wolf behavior. Starting with a model for benefits of prey and costs of travel, we found that prey distribution may influence mean size, quality, and fragmentation of simulated territories. Based on these preliminary results, we might expect differences in size or quality of territories in regions with different prey communities. Most importantly, this work provides a foundation from which we will build more complex models of territorial behavior of carnivores.