

How territoriality and sociality influence the habitat selection and movement of a large carnivore

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Abstract

1. While territoriality is one of the key mechanisms influencing carnivore space use, most studies quantify resource selection and movement in the absence of conspecific influence or territorial structure without inference on resource selection processes. 2. Our analysis incorporated intra-specific competition in a resource selection framework, via territorial data of conspecifics, to investigate mechanisms of territoriality and to better understand the role of neighboring packs on African wild dog habitat selection. We fit integrated step selection functions to 3-hour GPS data from 12 collared wild dog packs in the Okavango Delta, and estimated selection coefficients using a conditional Poisson likelihood with random effects. 3. Packs selected for the outline of their neighbors' 30-day boundary (defined as their 90% kernel density estimate), and for the outline of their own 90-day core (defined as their 50% kernel density estimate). Neighbors' 30-day boundary had a greater influence on resource selection than any habitat feature. Habitat selection differed when they were within versus beyond their neighbors' 30-day boundary. 4. Pack size, pack age, pup presence, and seasonality all mediated how packs responded to neighbors, and seasonal dynamics altered the strength of residency. While newly-formed packs and packs with pups avoided their neighbors' boundary, older packs and those without pups selected for it. Packs also selected for the boundary of larger neighboring packs more strongly than that of smaller ones. 5. Social structure within packs has implications for how they interact with conspecifics, and therefore how they are distributed across the landscape. Future research should continue to investigate how territorial processes are mediated by social dynamics and, in turn, how territorial structure mediates resource selection and movement. These results could inform the development of a human-wildlife conflict (HWC) mitigation tool by co-opting the mechanisms of conspecific interactions to manage space use of endangered carnivores.

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