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Assessing nocturnal habitat selection of small mammals on an urban-rural gradient using camera trapping

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Scan for all trail camera highlights!

INTRODUCTION

Urban development forces city and town boundaries to encroach further into wildland habitats and natural landscapes all over the world, causing immense habitat loss and fragmentation (Ritzel et al. 2020).

Mesocarnivores (raccoons, skunks, foxes, etc.) adjust their foraging behaviors in urban areas to utilize artificial resources better communally (Grinder and Krausman 2001), enabling small mammals to move further into urban habitats as densities within rural ranges increase.

Along an urban-rural gradient, it was expected that nocturnal mammals would select anthropogenic habitats rather than exhibit use based on availability and would display significant selection between wildland and urban habitats.

METHODS

The study site is a 3.40 acre private residence and horse facility in McKinleyville. The property is roughly 25% forest and undeveloped, 25% residential and farmyard habitat, and 50% pastures, grazing areas, and few dispersed trees and shrubs.

Six trail cameras were installed at low-level post positions (3-4 ft height) in locations representing the three habitat types. The cameras were programmed to run 8pm - 6am and were moved to different locations within the habitat type. A chi-square test was used to determine habitat selection among all species.

RESULTS

The camera data showed that nocturnal mammals were selecting for forested and undeveloped habitat, used residential and farmyard areas about proportionately, and were significantly avoiding pastures and grassland areas (fig. 1, $x^2 = 74.4$, $P \leq 0.001$).

The data rejects the initial prediction that small mammals would select for residential and farmyard habitat, but does confirm the prediction that mammals select for habitat type, and use is inconsistent with availability.

Grey foxes (*Urocyon cinereoargenteus*) in undeveloped habitat

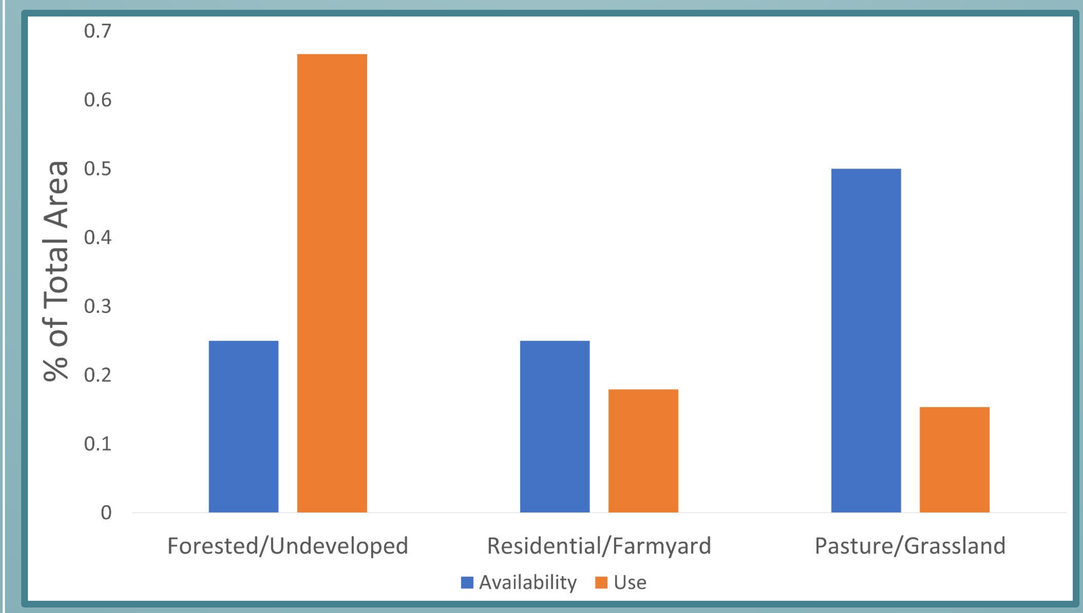

Figure 1: Mammals readily selected for undeveloped habitat, and heavily avoided pastures and grasslands, confirming the null hypothesis.

Striped skunk (*Mephitis mephitis*) in forested habitat

DISCUSSION

There are growing needs to establish effective and sustainable management plans for small mammal and carnivore species that are increasingly coming into contact with humans along wildland-urban gradients. Determining habitat selection and suitability parameters will help better inform future efforts to minimize human-wildlife conflict as urban expansion continues globally.

Understanding the preference for nocturnal mammals to use undeveloped or understory habitat, even when less available, has a lot of potential. For instance, the implementation of vegetated migratory corridors, or "living fences", through residential areas may be a useful and visually appealing method of mitigating backyard conflict.

LITERATURE CITED

Grinder, M.I., and P.R. Krausman. 2001. Home range, habitat use, and nocturnal activity of coyotes in an urban environment. The Journal of Wildlife Management 65 (4): 887-898.

Ritzel, K., and T. Gallo. 2020. Behavior change in urban mammals: a systematic review. Frontiers in Ecology and Evolution 8:576665.

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