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## HOW DO NONNATIVE PLANTS AFFECT SMALL MAMMALS? EFFECTS OF VEGETATION STRUCTURE ON ESCAPE ABILITY OF SMALL MAMMALS

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Nonnative plants can alter habitat of native animals through changes in vegetation structure and availability of food resources. Invasion of nonnative cheatgrass (*Bromus tectorum* L.) is an acute threat to persistence of native wildlife in the sagebrush steppe ecosystem of southwestern Montana. Cheatgrass invasion increases vegetation density and litter depth between shrubs, potentially increasing risk of predation by impeding an animal's ability to escape. We examined how vegetation density and litter depth affects maximum sprint speed, as one component of a project investigating how changes in the structural complexity of vegetation due to cheatgrass invasion affects small mammals. Using artificial materials to mimic cheatgrass structure and litter, we timed deer mice (*Peromyscus*

*maniculatus*) sprinting through a range of litter depths and structure densities along a 2 m-long track, to assess each animal's ability to flee from a predator. We found that median sprint time increased 15 percent (95% CI = 13-18%) for every additional 1000 stems/m<sup>2</sup>; increases in litter depth  $\leq 9$  cm had little effect on sprint speed. If predation is a limiting factor for small mammal populations within sagebrush steppe, management tools that can reduce vegetation density of nonnative plants may be beneficial. Litter removal may only benefit small mammals if accumulations are reduced to less than 9 cm in depth. Increasing our understanding of how small mammals respond to changes in vegetation architecture caused by nonnative plants may help inform management and restoration efforts, especially when complete eradication is unlikely.