
MECHANISMS DRIVING NONNATIVE PLANT-MEDIATED CHANGES IN SMALL MAMMAL POPULATIONS AND COMMUNITIES

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Nonnative plants can dramatically alter habitat of native animals through changes in vegetation structure and availability of food resources. Range expansion by nonnative cheatgrass (*Bromus tectorum L.*) is an acute threat to persistence of native species in the sagebrush-steppe ecosystem of southwestern Montana. As climate changes over the next century, rangelands in Montana are likely to become more hospitable to this invasive grass. Although declines in small mammal diversity and abundance previously have been documented with cheatgrass invasion, we know little about the underlying mechanisms driving these changes. We will explore potential mechanisms for nonnative plant-mediated changes on three species of native mammals: deer mouse (*Peromyscus maniculatus*), montane vole (*Microtus montanus*), and sagebrush vole (*Lemmyscus curtatus*) in sage-steppe communities at the Gravelly-Blacktail Wildlife Management Area (WMA). We will quantify changes in vegetation characteristics in areas invaded by cheatgrass; based on this information, we will develop experimental treatments that mimic individual modified characteristics. We will apply these treatments to randomly selected plots on the WMA and establish appropriate controls. Using standard capture-mark-recapture methods, we will estimate abundance and species diversity of small mammals and make comparisons between treated and control plots to quantify effects. We will also quantify and compare body condition, predator avoidance, and diet to explore additional mechanisms driving changes in mammalian abundance and diversity. Identifying the mechanisms for how cheatgrass invasion alters populations and communities of native species will provide critical information to inform conservation and management of some of Montana's native small mammals.