

## EFFECTS OF SPOTTED KNAPWEED AND ITS BIOLOGICAL CONTROL AGENTS ON DEER MOUSE ECOLOGY<sup>TWS</sup>

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We studied a spotted knapweed- (*Centaurea maculosa*) infested grassland of westcentral Montana to examine the effects of knapweed invasion and 2 gall fly biological control agents (*Urophora affinis* and *U. quadrifasciata*) on deer mouse (*Peromyscus maniculatus*) ecology. Stomach-content analysis indicated that gall flies were the primary food item in deer mouse diets for most of the year and comprised 85 to 90% of the diet during winter. Deer mouse stomach contents also revealed that wild-caught mice consumed on average up to 247 gall fly larvae/mouse/day, whereas feeding trials established that deer mice could depredate nearly 5 times as many larvae under laboratory conditions. Feeding trials showed that deer mice avoided depredating uninfested knapweed capitula while selecting capitula with the highest gall fly infestations. Deer mice selected microhabitats with moderately high

(31-45% cover) and high knapweed infestation (=46% cover) when gall fly larvae were present in knapweed capitula. After gall flies emerged and larvae were unavailable to deer mice, mice reversed habitat selection to favor native-prairie dominated sites with low knapweed infestation (0-15%) while avoiding high-density knapweed stands. Deer mice appear to select for high-density knapweed stands because they exploit gall fly larvae in knapweed-infested habitats. Invasion of native prairie by spotted knapweed and the release of gall flies as biological control agents for knapweed has altered deer mouse habitat selection, diet, and possibly demographics. Knapweed invasion of native grassland systems may disrupt small mammal community composition resulting in indirect effects which impact predator communities.