

DO HIGHWAYS FORM BARRIERS TO SMALL MAMMAL MOVEMENT AND GENE FLOW? ^{TWS}

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Highways can adversely affect wildlife populations by increasing mortality due to vehicular collisions and by discouraging crossing attempts, leading to decreased connectivity among populations. We are investigating these issues using small mammals as a model system. First, we are using mark-recapture analyses to compare movement adjacent to highways to movement across highways for small mammals in forested areas in western Montana. Second, we are determining rates of gene flow across highways and the degree of genetic differentiation that may have occurred in red-backed voles (*Clethrionomys gapperi*), deer mice (*Peromyscus maniculatus*), and vagrant shrews (*Sorex vagrans*). In our first field season, we recorded 1378 captures of 624 individuals of 10 species. Preliminary results indicate that more individuals moved between grids on the same side of the highway than between grids separated by the highway: 39 movements adjacent to the highway versus 16 movements across the highway. These 55 movements were completed by 40 individuals, 75 percent of which were male. Deer mice and chipmunks appeared to be more successful at crossing highways than red-backed voles. Only one vole (who crossed twice) was ever captured on both sides of the highway, compared to seven movements of five individuals adjacent to the highway. Our goal is to assess the barrier effect of highways of different widths on various species of small mammals, so that these negative impacts can be identified and mitigated in the future.